Handbook of COVID-19
Infection Prevention & Control for Healthcare Workers

INFECTION PREVENTION & CONTROL PROGRAM
Department of Pathology
RMU & Allied Hospitals Rawalpindi
Motto

Vision

- To Impart Evidence Based Research Oriented Medical Education.
- To Provide Best Possible Patient Care.
- To Inculcate the Values of Mutual Respect & Ethical Practice of Medicine.
MESSAGE BY THE VICE CHANCELLOR

The world is undergoing difficult times at the moment due to the outbreak of the COVID-19 infection that has now affected at 194 nations worldwide. People from all races, castes, religions and social status are being infected by the virus without any discrimination. The magnitude of the affects of this pandemic can be estimated from the fact that even the super powers of this world with strongest economies are finding it virtually impossible to cope with the devastation of the disease that is threatening to push the humanity to the ways of the stone age. When the strong armies and the military might of the nations is becoming helpless against the disease, it is heart warming fact that the medical personnel around the world have emerged as the heroes to defend their nations and all the humanity alike, against the deadly virus. No matter what the circumstances are, whether belonging to the first world or the third world countries, what this breed of heroes share amongst them is the desire to serve and save their fellow human beings from the misery in their time of need. With own life at risk and rapidly depleting supplies of the protective gear for themselves, a major defense against the deadly virus is ensuring the safe infection control practices, proper and judicious use of PPE and proper disposal of waste, to ensure not only own safety, but also to save precious resources that can help save more lives on another day. To aid in this effort, it is a remarkable effort by the Infection Prevention & Control Program of the Pathology Department, Rawalpindi Medical University to compile this guide for safe practices related to the care and management of the COVID19 patients. I am sure their effort will go a long way in aiding to save human lives and resources of a third world country like Pakistan.

Professor Muhammad Umar
MBBS, MCPS, FCPS (PAK), FACP (USA), FRCP (L), FRCP (G), ASGE-M(USA), AGAF (USA)
Vice Chancellor, Rawalpindi Medical University
Professor of Medicine Rawalpindi Medical University
Chief Gastroenterology & Hepatology Division
Clinical Coordinator of Hepatitis Prevention and Control Program,
Holy Family Hospital Rawalpindi Pakistan
Ex-Governor, American College of Gastroenterology (ACG)
Chairman Asia Hep Pakistan
Past President Pakistan Society of Gastroenterology
Past President Pakistan Society of Hepatology
President Rawalians’ Research Forum
PREFACE

The world today in unison is facing a huge challenge in the form of the COVID19, a viral infection caused by the Corona Virus. The disease emerged at the end of 2019 and now rapidly sweeping whole of the world causing mortalities around the globe. Recently the disease has been termed as a pandemic with declaration of global health emergency by the World Health Organization (WHO). The disease is known to spread from the person to person through droplet infection and till now has no established treatment, causing the healthcare systems around the globe to collapse. Healthcare workers including the laboratory personnel are among the high-risk group for acquiring the infection. Only solution is to ensure proper measures to prevent the transmission and acquisition of infection through following good infection control & disinfection practices, proper use of PPEs and infective waste disposal.

The purpose of this document is to provide basic necessary guidance on the effective & judicious use of Personnel Protective Equipment (PPE) in different settings and situations. The document also aims to serve as a quick reference guide on safe laboratory and biosafety practices related to the storage, transport & testing of clinical specimens of patients, as well as disinfection related to the different situations in relation to the patients that meet the case definition of the novel pathogen identified in Wuhan, China, i.e. 2019 novel coronavirus (2019-nCoV), the disease named COVID-19.

While information provided here is in lines with the current recommendations of the Health Department Government of Punjab, National Institute of Health, Center for Disease Control (CDC) USA and the World Health Organization (WHO) for appropriate use of PPEs, monitoring of availability & implementation of safe practices related to PPEs, collection & storage of samples as well as disinfection practices for different situations, it is recommended to ensure that health setups adhere to appropriate biosafety practices provided in the national guidelines from time to time. Any testing for the presence of 2019-nCoV or clinical specimens from patient meeting the suspect case definition should be performed in appropriately equipped laboratories by staff trained in the relevant technical and safety procedures. National guidelines on the laboratory biosafety should be followed in all circumstances.

We acknowledge the valuable resources provided by the Health Department Govt. of the Punjab, National Institute of Health Pakistan, World Health Organization (WHO) and Centers for Disease Control USA; which have been used in formulating these guidelines.

We would like to extend our deepest gratitude towards Prof. Dr. Muhammad Umar, The Vice Chancellor, Rawalpindi Medical University & Allied Hospitals for the making the publication of these guidelines possible.

This effort is dedicated to our warriors in white coats who are fighting on the forefront against COVID19 pandemic.

Prof. Dr. Naeem Akhtar
MBBS (Pb), Ph.D. Microbiology (Sheffield, UK)
Chairman, Pathology Department, RMU & Allied Hospitals, Rwp.
Dean Basic Sciences & Diagnostics, RMU & Allied Hospitals, Rwp.
Incharge Infection Prevention & Control Program, RMU & Allied Hospitals, Rwp.

Dr. Shirin Rafiq (Assistant Prof., Pathology Department, Rawalpindi Medical University)
Dr. Rabia Anjum (Pathologist, Pathology Department, Benazir Bhutto Hospital, Rwp.)
Dr. Syed Muhammad Ali (Senior Demonstrator, Pathology Department, RMU, Rwp.)
Dr. Kiran Ahmed (Sr. WMO, Pathology Department, Holy Family Hospital, Rwp.)
<table>
<thead>
<tr>
<th>Topic</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infection Prevention And Control Recommendations For Corona Outbreak (COVID-19)</td>
<td>1</td>
</tr>
<tr>
<td>Personnel Protective Equipment (PPE)</td>
<td>5</td>
</tr>
<tr>
<td>Infection Prevention &amp; Control Checklist For Corona Outbreak (COVID-19)</td>
<td>6</td>
</tr>
<tr>
<td>Laboratory Biosafety Guide For Specimen Collection &amp; Transport (COVID-19)</td>
<td>9</td>
</tr>
<tr>
<td>Standard Operating Procedures (SOPs) For Collection, Storage &amp; Transportation Of Specimens For Novel Coronavirus Diagnosis</td>
<td>10</td>
</tr>
<tr>
<td>Respiratory Specimens (Nasopharyngeal Swabs, Oropharyngeal Swabs, Bronchoalveolar Lavage, Sputum, Endotracheal Aspirate)</td>
<td>10</td>
</tr>
<tr>
<td>Specimen Transport &amp; Storage Requirements</td>
<td>12</td>
</tr>
<tr>
<td>SOPs For The Routine Laboratory Procedures</td>
<td>13</td>
</tr>
<tr>
<td>SOPs For Laboratory Spill &amp; Waste Management Of Corona Virus Patients</td>
<td>15</td>
</tr>
<tr>
<td>Disinfection Practices (COVID-19)</td>
<td>16</td>
</tr>
<tr>
<td>Disinfection Protocols For Equipment &amp; Environment</td>
<td>17</td>
</tr>
<tr>
<td>COVID-19 Disinfection Protocols For Laundry</td>
<td>18</td>
</tr>
<tr>
<td>COVID-19 Disinfection Protocols For Utensils</td>
<td>18</td>
</tr>
</tbody>
</table>
Infection Prevention & Control Recommendations for Corona Outbreak (COVID-19)

INFECTION PREVENTION & CONTROL PROGRAM
Department of Pathology
RMU & Allied Hospitals Rawalpindi
<table>
<thead>
<tr>
<th>Setting</th>
<th>Personnel</th>
<th>Activity Type</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patients Waiting Area</strong></td>
<td><strong>Patients with respiratory symptoms.</strong></td>
<td>Patient in waiting</td>
<td>Provide medical mask (At least 3-Layered) if tolerated. Immediately move the patient to an isolation room or separate area away from others; if this is not feasible, ensure spatial distance of at least 1 m from other patients. Hand-hygiene and availability of hand sanitizers. Segregation of infectious waste in color coded bins. Proper disposal of infectious waste.</td>
</tr>
<tr>
<td></td>
<td><strong>Patients without respiratory symptoms.</strong></td>
<td>Patient in waiting</td>
<td>No PPE required Hand-hygiene and availability of hand sanitizers Segregation of infectious waste in color coded bins. Proper disposal of infectious waste.</td>
</tr>
<tr>
<td><strong>Corona Clinic</strong></td>
<td><strong>Healthcare workers</strong></td>
<td>Physical examination of patient with respiratory symptoms.</td>
<td>Medical mask (At least 3-Layered) Gown Gloves Eye protection Hand-hygiene and availability of hand sanitizers Segregation of infectious waste in color coded bins. Proper disposal of infectious waste.</td>
</tr>
<tr>
<td><strong>Isolation Room</strong></td>
<td><strong>Healthcare workers (Doctors &amp; Nursing Staff)</strong>*</td>
<td>Providing direct care to COVID-19 patients.</td>
<td>N95/Medical mask (At least 3-Layered) Full body suit (Tyvek Suit) Gown Gloves Eye protection (goggles or face shield). Hand-hygiene and availability of hand sanitizers Segregation of infectious waste in color coded bins. Proper disposal of infectious waste.</td>
</tr>
<tr>
<td>Setting</td>
<td>Personnel</td>
<td>Activity Type</td>
<td>Recommendations</td>
</tr>
<tr>
<td>--------------</td>
<td>------------------------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Isolation Room | Healthcare workers (Doctors & Nursing Staff) | Aerosol-generating procedures performed on COVID-19 patients.                  | Respirator N95 standard, or equivalent.  
Gown  
Gloves  
Eye protection  
Apron  
Hand-hygiene and availability of hand sanitizers  
Segregation of infectious waste in color coded bins.  
Proper disposal of infectious waste. |
|              | Cleaners                                       | Entering the room of COVID-19 patients.                                       | Medical mask (At least 3-Layered)  
Gown  
Heavy duty gloves  
Eye protection (if risk of splash from organic material or chemicals).  
Boots or closed work shoes.  
Hand-hygiene and availability of hand sanitizers  
Segregation of infectious waste in color coded bins.  
Proper disposal of infectious waste. |
|              | Visitors* ("Restriction of visitors is recommended") | Entering the room of a COVID-19 patient                                      | Medical mask (At least 3-Layered)  
Gown  
Gloves  
Hand-hygiene and availability of hand sanitizers  
Segregation of infectious waste in color coded bins.  
Proper disposal of infectious waste. |
| HDU / ICU    | Healthcare workers (Doctors & Nursing Staff)   | Providing direct care to COVID-19 patients.                                  | N95 mask  
Full body suit (Tyvek Suit)  
Gown  
Gloves  
Eye protection (goggles or face shield).  
Hand-hygiene and availability of hand sanitizers  
Segregation of infectious waste in color coded bins.  
Proper disposal of infectious waste. |
<table>
<thead>
<tr>
<th>Setting</th>
<th>Personnel</th>
<th>Activity Type</th>
<th>Recommendations</th>
</tr>
</thead>
</table>
| HDU / ICU          | Healthcare workers         | Aerosol-generating procedures performed on COVID-19 patients. | Respirator N95  
Appearing suit (Tyvek Suit)  
Gown  
Gloves  
Eye protection  
Apron  
Hand-hygiene and availability of hand sanitizers  
Segregation of infectious waste in color coded bins  
Proper disposal of infectious waste. |
|                    | Cleaners                   | Entering the room of COVID-19 patients.          | N95 mask  
Full body suit (Tyvek Suit)  
Gown  
Heavy duty gloves  
Eye protection (if risk of splash from organic material or chemicals)  
Boots or closed work shoes  
Hand-hygiene and availability of hand sanitizers  
Segregation of infectious waste in color coded bins  
Proper disposal of infectious waste. |
| Respiratory Sample Collection | Nursing Staff / Lab Technician | Manipulation of Respiratory Systems | N95 Mask *(Compulsory)*  
Gowns  
Nitrile Gloves  
Goggles  
Aprons  
Impervious Shoe Covers  
Hand-hygiene and availability of hand sanitizers  
Segregation of infectious waste in color coded bins  
Proper disposal of infectious waste. |
| Collection of Other Samples | Nursing Staff | All samples except respiratory / Aerosol producing | Medical Mask *(At least 3-Layered)*  
Gowns  
Nitrile Gloves  
Goggles  
Aprons  
Impervious Shoe Covers  
Hand-hygiene and availability of hand sanitizers  
Segregation of infectious waste in color coded bins  
Proper disposal of infectious waste. |

References:
- Laboratory biosafety guidance related to the novel coronavirus (2019-nCoV) --- World Health Organization.
PERSONNEL PROTECTIVE EQUIPMENT (PPE)

3 Layered Medical/Surgical Mask

N95 Mask

N95 Respirator

Goggles

Gloves

Shoe Covers

Gown

Full Body Suit / Tyvek Suit
Infection Prevention & Control Checklist for Corona Outbreak (COVID-19)

INFECTION PREVENTION & CONTROL PROGRAM
Department of Pathology
RMU & Allied Hospitals Rawalpindi
Infection Prevention & Control Checklist for Corona Outbreak (COVID-19)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Date: DD MM YY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital:</td>
<td>HFH</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Setting</th>
<th>Items</th>
<th>AVAILABILITY STATUS</th>
<th>IMPLEMENTATION STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients Waiting Area</td>
<td>Medical mask (At least 3-Layered)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hand sanitizers &amp; Hand Washing Practices</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Color coded infectious disposal bins</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Proper disposal of infectious waste</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corona Clinic</td>
<td>Medical mask (At least 3-Layered)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gown</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gloves</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Eye protection</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hand sanitizers &amp; Hand Washing Practices</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Color coded infectious disposal bins</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Proper disposal of infectious waste</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Isolation Room</td>
<td>N95/Medical mask (At least 3-Layered)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Respirator N95 (For Close Personal Contact Only)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gown</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gloves</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Eye protection (goggles or face shield)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hand sanitizers &amp; Hand Washing Practices</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Color coded infectious disposal bins</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Proper disposal of infectious waste</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Setting</td>
<td>Item</td>
<td>AVAILABILITY STATUS</td>
<td>IMPLEMENTATION STATUS</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-----------------------------------------------------------</td>
<td>---------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>HDU / ICU</td>
<td>N95/Medical mask (At least 3- Layered)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Respirator N95 (For Close Personal Contact Only)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gown</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gloves</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Eye protection (goggles or face shield)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hand sanitizers &amp; Hand Washing Practices</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Working boots / closed shoes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Color coded infectious disposal bins</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Proper disposal of infectious waste</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respiratory Sample</td>
<td>N95 Masks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collection</td>
<td>Gown</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nitrile Gloves</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Goggles</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Impermeable Shoe Covers</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hand sanitizers &amp; Hand Washing Practices</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Color coded infectious disposal bins</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Proper disposal of infectious waste</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collection of Other</td>
<td>3 Layered Masks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Samples</td>
<td>Gown</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nitrile Gloves</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Goggles</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Impermeable Shoe Covers</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hand sanitizers &amp; Hand Washing Practices</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Color coded infectious disposal bins</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Proper disposal of infectious waste</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Remarks:

Infection Control Nurse ___________________________   Infection Control Officer ___________________________
STANDARD OPERATING PROCEDURES (SOPs) FOR COLLECTION, STORAGE & TRANSPORTATION OF SPECIMENS FOR NOVEL CORONAVIRUS DIAGNOSIS

RESPIRATORY SPECIMENS (Nasopharyngeal Swabs, Oropharyngeal Swabs, Bronchoalveolar Lavage, Sputum, Endotracheal Aspirate)

1. Dacron or polyester flocked swabs
2. Tongue depressor (for Oropharyngeal swab)
3. Vial with Viral Transport Medium (VTM)
4. Pen/marker
5. Disposable gloves
6. Disposable gown
7. N95 mask
8. Goggles or face shield
9. Specimen transport container with ice packs
10. Specimen label and form
11. Biohazard bags
12. Tissues
13. Soap and water
14. Hand sanitizer
15. Disinfectant

Personnel Responsible

Trained nursing staff, infection control nurse or trained laboratory personnel with appropriate PPEs will be responsible for collection, storage & transport of specimens; ensuring all vials/tubes/containers are sealed & labeled appropriately.

Procedure

1. Safety requirements and PPE
2. Wear disposable gloves and change gloves after each patient.
3. Wash or sanitize hands before putting on and after removing gloves.
5. Wear a N95 mask to minimize exposure to infection during specimen collection.
6. Follow standard precautions and any additional precautions specific to the setting or patient.
7. Dispose of all contaminated waste (gloves, paper, swab handles, etc.) into biohazard waste bags for disposal.

Timing

1. Nasopharyngeal (NP) and Oropharyngeal (OP) swabs should be collected as soon as possible after enrollment.
2. The NP swab for VTM should be collected first, followed by the OP swab. Both swabs will be placed in the same vial of VTM.
Note: Placing the NP & OP swabs in the same tube increases the viral load.

**Nasopharyngeal Swab**

1. Explain the procedure to the patient. Emphasize the importance of remaining still during specimen collection to minimize discomfort.
2. Position the patient in a comfortable position.
3. Tilt the patient’s head back at a 70-degree angle as shown here.
4. Remove the flocked swab from its protective package.
5. Insert the swab into one nostril horizontally (not upwards) and continue along the floor of the nasal passage for several centimeters until reaching the nasopharynx (resistance will be met). The distance from the nose to the ear gives an estimate of the distance the swab should be inserted.
6. Do not force the swab. If obstruction is encountered before reaching the nasopharynx, remove the swab and try the other side.
7. Rotate the swab gently through 180 degrees to make sure adequate specimen is obtained. Leave the swab in place for 2-3 seconds to ensure absorbance of secretions.
8. Remove swab and immediately place into vial with VTM by inserting the swab at least ½ inch below the surface of the media. Cut the excess swab handle to fit the transport medium vial and reattach the cap securely.

**Oropharyngeal Swab**

1. Ask the patient to open his/her mouth.
2. Press the outer two-thirds of the tongue down with a tongue depressor, making the tonsils and the posterior wall of the throat visible.
3. Insert swab, avoiding touching the teeth, tongue, or the depressor.
4. Rub the swab over both tonsillar pillars and posterior oropharynx. This will cause the patient to gag briefly.
5. Place the swab into the vial containing VTM (same vial as the first NP swab).
6. Cut the excess swab handle to fit the transport medium vial and reattach the cap securely.
7. Carefully label specimen with patient ID number, and date and time of specimen collection.
8. Complete specimen tracking log with patient ID number, date and time of specimen collection.
9. Place specimen in cool box on ice.

**Sample Transportation of Suspected 2019 nCoV Samples**

1. Important: Transfer specimen with tracking log to the laboratory as soon as possible. Ensure that personnel who transport specimens are trained in safe handling practices and spill decontamination procedures.
2. Follow the requirements in the national or international regulations for the transport of dangerous goods (infectious substances) as applicable.
3. Deliver all specimens by hand whenever possible to NIH, Islamabad.
4. Notify the National Reference laboratory (e.g. NIH Islamabad) as soon as possible that the specimen is being transported.

### Specimen Transport & Storage Requirements

<table>
<thead>
<tr>
<th>SPECIMEN</th>
<th>TEMPERATURE FOR TRANSPORT TO LAB</th>
<th>STORAGE TEMPERATURE</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nasopharyngeal &amp; Oropharyngeal Swab</td>
<td>4 °C <em>(In Icebox)</em></td>
<td>≤48 hours: 4 °C</td>
<td>The nasopharyngeal and oropharyngeal swabs should be placed in the same tube to increase the viral load.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt;48 hours: -70 °C</td>
<td></td>
</tr>
<tr>
<td>Bronchoalveolar Lavage</td>
<td>4 °C <em>(In Icebox)</em></td>
<td>≤48 hours: 4 °C</td>
<td>Ensure that the screw capped container is properly sealed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt;48 hours: -70 °C</td>
<td></td>
</tr>
<tr>
<td>Sputum</td>
<td>4 °C <em>(In Icebox)</em></td>
<td>≤48 hours: 4 °C</td>
<td>Ensure that the material is from the lower respiratory tract.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt;48 hours: -70 °C</td>
<td></td>
</tr>
<tr>
<td>Endotracheal Aspirate, Nasopharyngeal Aspirate or Nasal Wash</td>
<td>4 °C <em>(In Icebox)</em></td>
<td>≤48 hours: 4 °C</td>
<td>Ensure that the screw capped container is properly sealed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt;48 hours: -70 °C</td>
<td></td>
</tr>
</tbody>
</table>

**References:**

- Laboratory biosafety guidance related to the novel coronavirus (2019-nCoV )--- World Health Organization.
SOPs FOR THE ROUTINE LABORATORY PROCEDURES

To be conducted adopting practices and procedures described for clinical and microbiology laboratories.

Routine Laboratory Procedures Include:
Diagnostic testing of serum, blood (including hematology and clinical chemistry), stool or other specimens.

CORE REQUIREMENTS

Good Microbiological Practice and Procedure (GMPP):
- Never storing food or drink, or personal items in the laboratory.
- Thoroughly frequently washing hands, preferably with warm running water and soap.
- While working open flames or heat sources are never placed near flammable supplies.
- Coverings over any cuts or broken skin prior to entering the laboratory.
- Ensuring prior to entry into the laboratory that supplies of laboratory equipment and consumables, including reagents, PPE and disinfectants, are sufficient and appropriate for the activities being performed.
- Ensuring supplies are stored appropriately and safely to reduce the chance of accidents such as spills, trips or falls for laboratory personnel.
- Ensuring proper labeling of all biological agents.
- Prohibiting the use of earphones.
- Appropriately covering or removing any jewelry.
- Refraining from using mobile electronic devices.

Personnel Responsible
Trained personnel with appropriate PPEs will be responsible for collection & transport of specimens; ensuring all vials/tubes/containers are sealed & labeled appropriately.

TECHNICAL PROCEDURES

- Avoiding inhalation of biological agents. Ingestion of biological agents.
- Use good techniques to minimize the formation of aerosols and droplets when manipulating specimens.
- Handle all sharps and needles.
- Use ampoule openers for safe handling of ampoules. Minimize the risk associated with the use of syringes or with needles.
- Never re-cap, clip or remove needles from disposable syringes.
- Dispose of any sharp materials (e.g. needles, needles combined with syringes, blades, broken glass) in puncture-proof or puncture-resistant containers fitted with sealed covers.
- Preventing dispersal of biological agents.
- Discard specimens and cultures for disposal in leak-proof containers with tops appropriately secured before disposal in dedicated waste containers.
- Consider opening tubes with disinfectant soaked pad/gauze.
- Decontaminate work surfaces with a suitable disinfectant at the end of the work.
• Ensure the disinfectant is efficacious against the pathogen being handled and is left in contact with infectious waste materials for sufficient time to effect complete inactivation.

APPROPRIATE DISINFECTANTS

Use Sodium hypochlorite (bleach - 0.1%) for general surface disinfection, 1% bleach solution for disinfection of blood spills, 62-71% ethanol, 0.5% hydrogen peroxide, quaternary ammonium compounds and phenolic compounds for different situations and procedures.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

• Laboratory coats must be used in laboratories to prevent personal clothing from getting contaminated by biological agents. Laboratory coats must have long sleeves, preferably with elasticized or fitted cuffs and must be worn closed.
• Always wear disposable gloves when handling specimens.
• Avoid contact of gloved hands with the face.
• Shield or otherwise protect the mouth, eyes and face during operation where splashes may occur.

EMERGENCY/INCIDENT RESPONSE PLAN

• To reduce the likelihood of exposure to/release of a biological agent or to reduce the consequences of such incidents Personnel must be trained on these procedures and have periodic refresher training to maintain competency.
• First-aid kits, including medical supplies such as bottled eye washes and bandages, must be available and easily accessible to personnel in sufficient supply.
• All incidents must be reported to the appropriate personnel in a timely manner. A written record of accidents and incidents must be maintained, response plans.
• Spill kits, including disinfectant, must be easily accessible to personnel.

OCCUPATIONAL HEALTH

The employing authority, through the laboratory director, must take responsibility for ensuring that the health of laboratory personnel. Personnel working in laboratories must be healthy and not suffering from any co-morbidities, asthmatic, respiratory symptoms and immunocompromise.

References:
• SOPs for COVID-19 – National Institute of Health, Pakistan.
• Laboratory biosafety guidance related to the novel coronavirus (2019-nCoV) --- World Health Organization.
SOP’S FOR LABORATORY SPILL & WASTE MANAGEMENT OF CORONA VIRUS PATIENTS

- Waste of all novel corona virus patient is considered as infectious.
- Staff (Cleaner / Ward boy) should wear proper PPE before handling waste.
- PPE for cleaner / ward boy includes Medical Mask, Gown, Latex/Rubber Gloves, Eye protection / face shield, Boots / Work shoes / Impermeable shoe covers.

Urine/Contaminated fluids:

- Discard urine / contaminated fluids in 0.5% bleach solution & leave for 30 minutes & discard.

Vials, Tubes and Plastic Containers:

- Empty all vials, tubes and containers in 0.5% bleach solution. Leave for 30 minutes & discard.
- Empty vials, tubes & containers should be thrown in double large yellow bags in yellow bins.
- Sealed yellow bag should be handed over to person from incinerator after labelling and weighing.
- Ensure regular documentation in dedicated COVID-19 register.

Spill Management:

- In the event of a spill of infectious material, use following spill clean-up procedure.
- Wear gloves and protective clothing, including overall, shoe covers, face and eye protection.
- Cover the spill with cloth or paper towels to contain it.
- Pour an appropriate disinfectant over the paper towels and immediately surrounding area.
- Apply disinfectant concentrically beginning at the outer margin of the spill area, working toward the center.
- After the appropriate amount of time (e.g. 30 min), clear away the materials.
- If there is broken glass or other sharps involved, use a dustpan or a piece of stiff cardboard to collect the material and deposit it into a puncture resistant container and send for incineration.
- Clean and disinfect the area of the spillage (can repeat the above-mentioned procedure)
- After cleaning up document it with complete history and inform authorities regarding the decontamination of the area.

References:

- Laboratory biosafety guidance related to the novel coronavirus (2019-nCoV)--- World Health Organization.
Disinfection Practices
(COVID-19)

INFECTION PREVENTION & CONTROL PROGRAM
Department of Pathology
RMU & Allied Hospitals Rawalpindi
DISINFECTION PROTOCOLS FOR EQUIPMENT & ENVIRONMENT

Disinfection should be done in each shift on daily basis with freshly made bleach solution:

- **SURFACE / EQUIPMENT CLEANING**
  - **Laboratory Equipment:**
    - Laboratory equipment in use should be wiped with detergent / soap solution as per the manufacturer’s recommendations.
    - Disinfect by 1% bleach solution made by 1:5 dilution of 5% bleach i.e. by dissolving 1 litre of 4 litre of water.
      (Note: Common commercially available household bleach e.g. Robbin Liquid Bleach has concentration of 3.5%)
  - **Reusable PPE Like Goggles:**
    - Reusable PPE like goggles should be washed with detergent / soap solution as per the manufacturer’s recommendations.
    - Disinfect by 1% bleach solution made by 1:5 dilution of 5% bleach i.e. by dissolving 1 litre of 4 litre of water.
    - Rinse with clean water.
  - **Countertops / Benches / Laboratory Equipment:**
    - Soiled / Contaminated Countertops / Benches should be washed with detergent / soap solution.
    - Disinfect by 1% bleach solution made by 1:5 dilution of 5% bleach i.e. by dissolving 1 litre of 4 litre of water.
  - **Floors:**
    - Soiled / Contaminated Surfaces should be washed with detergent / soap solution.
    - Disinfect by 0.5% bleach solution made by 1:10 dilution of 5% bleach i.e. by dissolving 1 litre of 9 litre of water.

- **AIR SPRAYING**
  - Spray for air disinfection can be done by 0.5% bleach solution made by 1:10 dilution of 5% bleach i.e. by dissolving 1 litre of 9 litre of water.

- **DISINFECTION OF AMBULANCE**
  - Soiled / Contaminated Surfaces should be washed with detergent / soap solution.
  - Disinfect with 5% bleach solution.

**GENERAL PROTOCOLS:**

- Separate disinfection team should be allocated for isolation/Corona Virus Wards and they should not be allowed to work outside of the designated wards.
- The teams should use recommended PPEs.
- Separate cleaning tools should be used for disinfection of doors, floors, walls, washrooms and table of isolation areas.
- Dilution of disinfectant bleach should be done in front of Head Nurse / Sanitary supervisor of the area.
COVID-19 DISINFECTION PROTOCOLS FOR LAUNDRY

Following protocols should be followed for laundry received from COVID-19 isolation ward:

- According to Punjab Govt. SOPs disposable bed sheets, table clothes and pillow covers are to be used and discarded in infectious waste for incineration but in case of non-availability of disposable items following precautionary measures are to be adopted in COVID-19 isolation wards and filter areas.
- The bed sheets, pillow covers, hospital clothes and other reusable laundry items used by the suspected as well as confirmed cases of COVID-19 are to be dealt as infectious items.
- Head nurse of the isolation ward should separate the laundry as infectious material in yellow polythene bag with biohazard sign on it.
- The laundry person is to be notified before receiving the infectious laundry from the ward.
- Contact precautions are to be followed.
- Disinfection of laundry will be done by using 0.5% Sodium Hypochlorite or Bleach solution. (Note: Common commercially available household bleach e.g. Robbin Liquid Bleach has concentration of 3.5%)

  - The solution can be prepared by mixing 14.2 grams of chlorine granules (35% sodium hypochlorite) to 1 liter of water. hence 14.2 grams of dry powder is added to 1 liter of water or 142 grams to 10 liters of water.
    - FORMULA:
      \[
      \frac{\text{% Hypochlorite in Use}}{\text{% Hypochlorite In Granules Or Powder As Indicated On Product Label}} \times 1000 = \text{Amount In Grams Of Granules To Add To Each Liter Of Water.}
      \]
  - Keep the laundry or reusable PPEs dipped in bleach solution for 30 minutes. Remove it from the solution.
  - Then wash it in a dedicated washing machine at temperature more than 38°C.
  - Air dry laundry in sunlight or steamer.
  - A record of all laundry sent from this area will be kept by head nurse and laundry person with daily signatures.

COVID-19 DISINFECTION PROTOCOLS FOR UTENSILS

- Food for the patients should be served in disposable utensils.
- The utensils after use should be discarded in Yellow colored bins / bags after disinfecting with 0.5% Bleach solution.

References:
- COVID19 Guidelines, Centers for Disease Control, USA.